

Code No: D3302

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**  
**M.TECH II - SEMESTER EXAMINATIONS, APRIL/MAY 2012**  
**QUALITY ENGINEERING IN MANUFACTURING**  
**(ADVANCED MANUFACTURING SYSTEMS)**

Time: 3 hours

Max. Marks: 60

**Answer any five questions**  
**All questions carry equal marks**

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- 1.a) What is quality and what factors are to be considered in the design of products?
- b) Differentiate between system design and parameter design which affect the quality.
- 2.a) How the tolerance design is made for L-type characteristic systems?
- b) How the tolerances and economics of production are inter-related?
- 3.a) What are the various factors selected for optimization of design using signal-to-noise ratio?
- b) What is quadratle loss function and explain its effect on quality?
4. A company wishes to test four different types of tyres A, B, C, and D. The lifetime of tyres as determined from their treads are given in(thousands of km) in Table I, where each tyre has been tried on 6-similar automobiles. Test the analysis of variance at 0.05 level whether there is a difference in them.

Table I

A	33	28	36	40	30	35
B	32	40	42	38	30	34
C	31	37	35	33	34	30
D	29	34	32	30	33	31

- 5.a) Describe about total variation, variation with in treatments and variation between treatments.
- b) How ANOVA is used for four level factors and multiple level factors?
- 6.a) How number of experiments to be carried out will be eliminated by orthogonal arrays?
- b) What are the test strategies used in orthogonal arrays?
- 7.a) How the experiments are designed and analyzed to find the faults of the system?
- b) What is the need and application of ISO-9000?
8. Answer the following:
  - a) Six-sigma
  - b) Quality circles
  - c) Steps in designing.

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